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RADIKALISCHE ZWISCHENSTUFEN BEI DER BILDUNG VON KALIUMTETRAETHYLALUMINAT AUS TRIETHYLALUMINIUM UND KALIUM

A COMMENT

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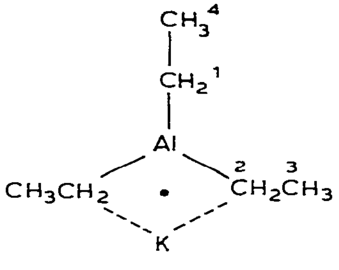
Summary

The ESR spectrum recently attributed to $(C_2H_5)_3AlK$ is identical with that of the biphenyl radical anion.

In a recent paper in this journal [1], an ESR spectrum observed after reacting potassium with triethylaluminium was assigned to the species I and analysed in terms of coupling of a_1 = 5.42 G (2 protons), a_2 = 2.71 G (4 protons) and a_3 = 0.41 G (6 protons). Somewhat surprisingly no coupling was resolved from either of the metal atoms or from the other methyl group.



(I)

I should like to point out that the published spectrum bears a striking resemblance to that of the biphenyl radical anion which in DME [2] has a_4 = 5.31 G (2 protons), a_2 = 2.66 G (4 protons) and a_3 = 0.41 G (4 protons). The only significant difference lies in the assignment of the small multiplet as a quintet rather than a septet. Computer simulation and measurement of line intensities in the published spectrum suggests that the multiplet observed by Hoberg et al. [1] is indeed a quintet. I propose, therefore, that the spectrum should be reassigned to the biphenyl radical anion. The origin of the biphenyl is obscure since the same spectrum was observed in a number of different solvents.

References

1 H. Hoberg, S. Krause and E. Ziegler, J. Organometal. Chem., 184 (1980) 1.
2 H. Nishiguchi, Y. Nakai, K. Nakamura, K. Ishizu, Y. Deguchi and H. Takaki, J. Chem. Phys., 40 (1964) 241.

ANMERKUNG ZUM COMMENT VON A. HUDSON

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Die grosse Ähnlichkeit zwischen dem von uns postulierten $(C_2H_5)_3AlK$-Radikal (I) und dem des Diphenyls war uns bekannt. Gegen das Vorliegen des Diphenyl-Radikals spricht das Auftreten von Septetts im ESR-Signal, die bei höherer Verstärkung klar erkennbar sind, sowie der bei Temperaturerhöhung beschriebene Übergang in Spezies II durch das in Fig. 2 wiedergegebene ESR-Spektrum. Vergleichende Messungen und Tests an den zum Einsatz gelangten Reagentien und Solventien veranlassen uns überdies eine Deutung des beobachteten Signals im Sinne (I) vorzunehmen.